



IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-2 (canceled).

Claim 3 (previously presented): A method for isotopically labeling a functional group possessed by an amino acid residue of a protein, comprising the step of reacting a transglutaminase with said protein in the presence of an isotope-labeled ammonium salt.

Claim 4 (previously presented): The method of Claim 3, wherein said amino acid residue is a glutamine residue and said functional group is a γ -carboxamido group.

Claim 5 (previously presented): The method of Claim 3, wherein said transglutaminase is calcium-independent.

Claim 6 (previously presented): The method of Claim 3, wherein said transglutaminase is calcium-dependent and said reacting said transglutaminase with said protein is conducted in the presence of calcium.

Claim 7 (previously presented): The method of Claim 3, wherein said transglutaminase is reacted with said protein in an aqueous environment at a pH of about pH5.0 to pH9.0 and a temperature of 4°C to 55°C for a time of about 30 seconds to about 2 days.

Claim 8 (previously presented): The method of Claim 3, wherein the ratio of the concentration of said ammonium salt to the concentration of said protein to be labeled is more than about 10.

Claim 9 (previously presented): The method of Claim 8, wherein the concentration of said protein to be labeled is about 1 μ M to about 40mM and the concentration of said ammonium salt is about 10 μ M to about 10M.

Claims 10-11 (canceled).

Claim 12 (withdrawn): A method of determining the substrate specificity of a transglutaminase, which comprises the steps of
(i) reacting the transglutaminase with a protein in the presence of an isotopically labeled ammonium salt, and
(ii) detecting glutamine residues in the protein which are isotopically labeled by step (i).

Claim 13 (withdrawn): The method of claim 12, wherein the transglutaminase is reacted with proteins under aquatic environment at the pH of about pH5.0 to pH9.0 and the temperature of 4°C to 55°C for about 30 seconds to about 2 days.

Claim 14 (withdrawn): The method of claim 12, wherein the concentration of the ammonium salt to the concentration of the protein to be labeled is more than about 10.

Claim 15 (withdrawn): The method of claim 14, wherein the concentration of the protein to be labeled is about 1 μ M to about 40mM and the concentration of the ammonium salt is about 10 μ M to about 10M.

Claim 16 (previously presented): An isotopically labeled protein, prepared by a process, comprising reacting a transglutaminase with a protein in the presence of an isotope-labeled ammonium salt, wherein said protein contains at least one glutamate residue on which said transglutaminase does not act and at least one glutamate residue on which said transglutaminase does act.

Claim 17 (previously presented): The isotopically labeled protein of Claim 16, wherein said transglutaminase is reacted with a functional group of an amino acid residue and said amino acid residue is a glutamine residue and said functional group is a γ -carboxamido group.

Claim 18 (previously presented): The isotopically labeled protein of Claim 16, wherein said transglutaminase is calcium-independent.

Claim 19 (previously presented): The isotopically labeled protein of Claim 16, wherein said transglutaminase is calcium-dependent and said reacting said transglutaminase with said protein is conducted in the presence of calcium.

Claim 20 (previously presented): The isotopically labeled protein of Claim 16, wherein said transglutaminase is reacted with said protein in an aqueous environment at a pH

of about pH5.0 to pH9.0 and a temperature of 4°C to 55°C for a time of about 30 seconds to about 2 days.

Claim 21 (previously presented): The isotopically labeled protein of Claim 16, wherein the ratio of the concentration of said ammonium salt to the concentration of said protein to be labeled is more than about 10.

Claim 22 (previously presented): The isotopically labeled protein of Claim 21, wherein the concentration of said protein to be labeled is about 1μM to about 40mM and the concentration of said ammonium salt is about 10μM to about 10M.

Claim 23 (new): The isotopically labeled protein of Claim 16, wherein said glutamate residue on which said transglutaminase acts is introduced into the protein by site-directed mutagenesis.

Claim 24 (new): The isotopically labeled protein of Claim 16, wherein said transglutaminase acts under a condition in which the three-dimensional structure of said protein is retained.